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GIANT TORTOISE PROMENADES WITH HIS EVOLUTIONARY GRANDSON

(See Bulletin No. 1)

HOW TO OBTAIN THE BULLETIN

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Galapagos Has Treasures of Nature and Pirates

AN AMERICAN expedition now in the Sargasso Sea is preparing, before its return, to revisit the Galapagos Islands. Here it plans to make further study and gather specimens in an incomparable museum of natural history.

Charles Darwin began the scientific exploration of the Galapagos Islands and he reported on the various species of giant tortoises, each species confined to a single islet, and pointed out that half the flowers and half the birds of the island are to be found nowhere else in the world.

More than 2,000 volcanic cones besprinkle the archipelago, one estimate has it, and the islands' volcanic origin accounts for the peculiar interest they hold for science. Darwin deduced that the group has not been nearer the mainland, nor have the islands been closer together, than now.

Unearth Real Pirate Gold

Hence the species of flowers and birds which drifted to the islands have undergone a development in their isolated environment very different from that in their native habitats. Seldom has nature provided such a clear-cut opportunity to study the processes of evolution.

The Galapagos hold a different sort of lure for the modern world. Most tales of hidden treasure warrant many grains of salt, but it seems certain that the pirates of South America hid their loot of gold and silver where they had their headquarters, in these islands. Two caches have been unearthed, silver ingots and pieces of eight. The finder of one built a hotel in Ecuador.

The islands lie just under the equator but the air frequently is chilly on some of them. The cold Antarctic currents which fan the coast of Peru strike seaward at Cape Blanco and surge across the Galapagos group. Up to 800 feet most of the islands are barren, above that level they are swathed in clouds whose moisture aids vegetation.

Area Greater Than Delaware

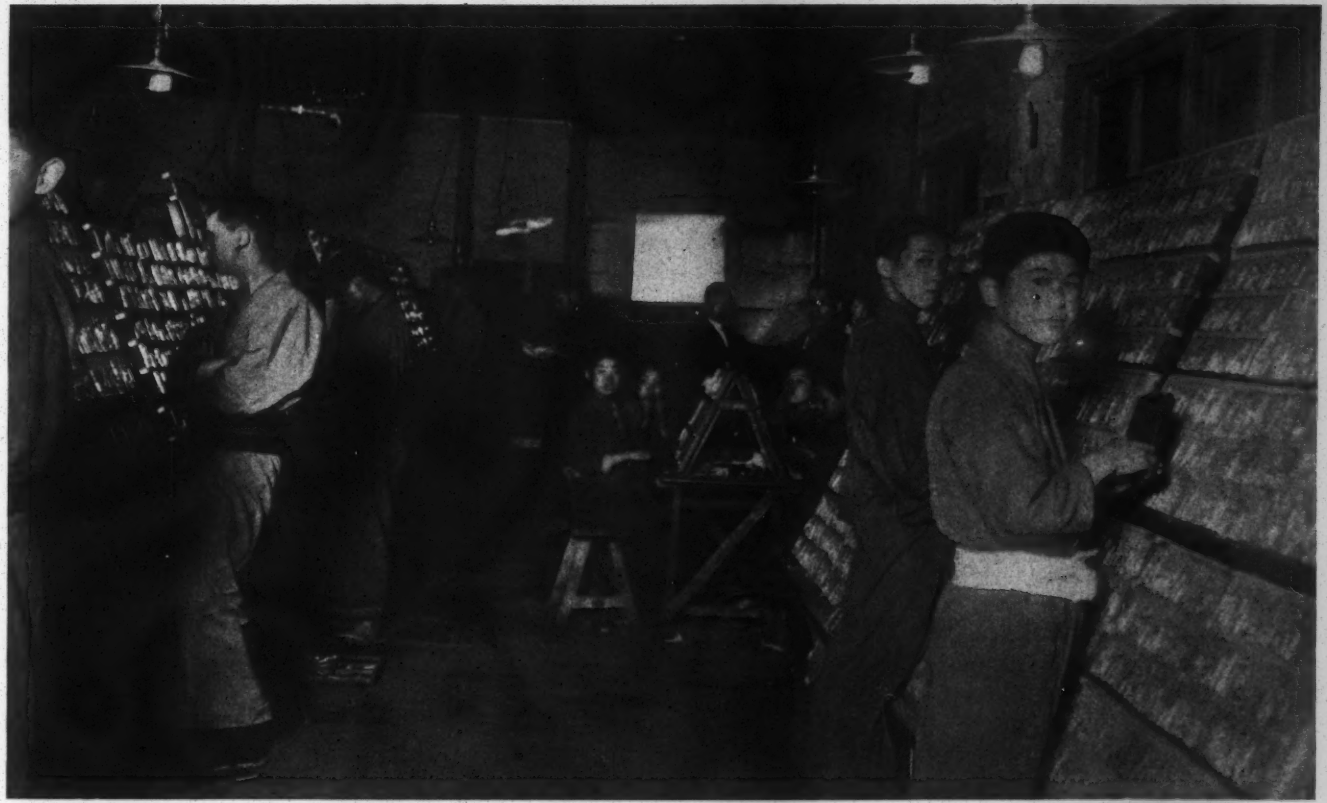
Wild goats, cattle, cats and dogs, as well as hidden treasure, bear evidence of the rendezvous of buccaneers. In 1832 Ecuador annexed the islands and since 1885 they have had a governor. They acquired a strategic importance with the opening of the Panama Canal, for they lie on the Canal-to-Australia route.

The largest island of the group, Albemarle, is larger than Long Island, New York; the entire group has an area considerably more than that of Delaware. The nearest of the islands to mainland is nearly 600 miles west of Ecuador.

Treasure and science to one side, as a famous humorist would say, the future of the islands looms large upon their agricultural merit. Ralph Stock, in his classic account of "The Dream Ship" expedition, wrote:

Farming In a Crater Garden

"The soil is a rich, red loam, almost stoneless, and scarcely touched by the plow. There are 3,500 head of cattle at present on Cristobal Island, and it could support 50,000 with ease. There is no disease and no adverse climatic condition with which to contend, and at three years old a steer brings $100 (gold),



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THE MAKING OF A JAPANESE NEWSPAPER: CHINESE BOYS PICKING UP IDEOGRAPHIC TYPES

Instead of working before a case of 26 letters, the Chinese compositor must pick his type from thousands of compartments, set all around the room. Usually he has a group of type-collectors working with him. To remember what character they are seeking, they sing it in a nasal monotone. Small wonder that a veteran printer, after professing Christianity, said that he "renounced the service of the devil and gave up printing." Imagine the bedlam of getting out an "extra" in a Japanese composing-room (see Bulletin No. 2).

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How Your Newspaper's Paper Is Made

EVERY PERSON who buys a 24-page newspaper for two cents cuts out of the forests of the United States or Canada a block of wood two inches high, three inches wide and four inches long. With the help of a paper mill a cord of wood informs 3,600 people of the day's news.

To convert that cord and millions more into newsprint, man has created a huge mechanical silkworm which munches its way through piles of spruce and balsam logs instead of mulberry leaves, digests with chemicals instead of secretions, stores its product in concrete tanks instead of thin-walled sacks, and spins its white thread, which is twelve and a half feet wide, with a copper tongue instead of a delicate membrane.

One Mill Has 1,800,000 "Circulation"

One plant produces in a single day sufficient paper to supply one 24-page paper apiece to about 1,800,000 subscribers. A single day's output of this mill, unrolled on the countryside, would cover a 1,400-acre ranch.

Rivers are the maidservants of the mechanical caterpillars that spin paper. They serve as power and transportation, and they supply water for pulp. Some modern mills use electricity exclusively.

On the St. Maurice river's broad back in Canada are carried annually logs enough to make a raft four feet wide, four feet high and nearly 200 miles long, or nearly two-thirds of the river's total length, all to supply one mill's maw.

At the river's edge are located water-pumps that would meet the needs of a city the size of Baltimore or Boston. The electric power from Shawinigan Falls used by this one mill would fill the daily requirements of Atlanta, Georgia, or Omaha, Nebraska.

A Log Puts Its Cheek to the Grindstone

Colossal machinery, capable of grasping the river's might, looms within the modern "newsprint" mill. From great piles of pulp wood, clear of bark and cut to four-foot lengths, automatic conveyors bring logs to the grinding room. The principle of this room's task is simple—it is that of a pencil pushed with its long side against a whirling grindstone. But the grindstone of a paper mill looks like the wheel of a terrible juggernaut; it is solid sandstone five feet in diameter and nearly as broad on the face. Such stones are generally hitched in pairs on an axle whose cross-section is as big as a large pie plate. Batteries of huge, whirring electric motors drive the great stones. Each stone reduces to pulp 17 cords of wood a day. A full-flowing creek plays over every grinder constantly to carry away and cool the pulp.

"Newsprint" cannot be made from ground wood alone, for this wood has no long fibers to hold like muscles when the metropolitan presses tear at the web. To three-fourths ground wood pulp must be added one-fourth "sulphite." Part of the logs received from storage yards go to a machine which chips them into inch-long pieces. These chips are packed into tanks 50 feet high. In another section of the mill sulphur from Louisiana, converted into sulphur dioxide gas, is filtered through a tank of limestone rock to get a solution of sulphur and lime.

live weight, at Guayaquil—when a steamer can be induced to call and take it there.

"There are a few hundred acres under cultivation when there might be thousands, and two hundred bone-lazy peons do the work of fifty ordinary farm hands.

"Looking down on this fertile valley, it is hard to realize that one is standing on the lip of a long-extinct crater, that in reality Cristobal is a series of these, dour and uninviting to a degree, viewed from outside, but veritable gardens within. And there are four other islands in the Galapagos group—some smaller, some larger, than Cristobal—uninhabited and exactly similar in character. Nominally, they belong to Ecuador. Here surely, is a new field for enterprise."

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TEKKE TURKOMANS AND RUSSIANS ON THE TRANS-CASPIAN RAILWAY

The Tekke Turkomans are huge, fine-looking men, whose daily headgear looks like the dress parade hat of a band leader. When one sees the erect Turkoman with his stalking camel or his loping horse which fits the desert vastness, he wonders why the Russians were able to humble him as they did (see Bulletin No. 5).

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To Map Aleutians Where Airmen Braved Perils

EXPLORATION and accurate mapping of the Alaska Peninsula with its unnumbered Aleutian Islands is to go forward this summer under the direction of government agencies. This spear of mainland with its long comet's tail of volcanic islands is remote from civilization. Last summer Major Martin, of the round-the-world flyers, and his helper crashed on a mountainside and were lost for days.

The entire Alaska Peninsula, extreme west of Alaska's mainland, is a mountain ridge of several hundred miles with spurs and sides sharply descending to the sea.

Only about a dozen permanent Eskimo settlements are left along 2,000 miles of indented coast.

A Land of Constant Fog

The Aleutian Range begins near the roots of the Alaska Peninsula and extends on out to its tip, and beyond into the Aleutian Islands. The highest peaks are near the eastern end, but even at the western tip of the peninsula heights of 6,000 feet and more are attained. Port Moller, the community to which the airmen made their way on foot last summer, is only about 150 miles from the tip of the peninsula. This little settlement, consisting for the most part of a salmon cannery, is on the Bering Sea or north side of the peninsula. It is close to the point where the 161st degree of west longitude crosses the 56th parallel of latitude.

A nest of high mountains almost surrounds the deep indentation on which Port Moller is situated, and the main ridge of the Aleutian Range with numerous peaks runs just south. Once having gotten over the land in the fog and struck down this range it was almost inevitable that a crash should occur. Between the peaks in this region are a number of low passes from the Pacific to Bering Sea. Through these blow moist winds from the Pacific which, meeting the colder air from the north, make this one of the foggiest regions on the peninsula.

Mirages Erect False Headlands

The mountains in this part of the peninsula are devoid of trees but stunted bushes grow in the hollows. No active volcanoes are known in the immediate vicinity of Port Moller, but about 75 miles farther west is Pavlof, one of the most striking of the ever-smoking peaks of Alaska.

Caribou, or wild reindeer, are the principal land animals in the Alaska Peninsula. The palmy days of walrus hunting and otter catching are past. Salmon fishing now is the all-important industry, and most of the settlements where white men are found are around canneries.

A phenomenon of the Alaska Peninsula is the mirage—that optical magician which shows headlands and islands in the air, paints snowy ridges where they don't exist, and erects Greek temples for the mind's eye.

Mapping Difficult

Spreading out as it does over so many degrees of latitude and longitude, Alaska has many differing climates; but in all sections a clear atmosphere is

This also goes to the "digester" holding the chips. Under pressure of steam the wood cooks for eight hours. When the tank's contents are discharged into the "blow pit" beneath, the binding material of the wood has been dissolved and the long, natural fibers left. After thorough washing and screening it is fit to join the ground pulp and serve as muscles and tendons in the paper.

Your Paper in 45 Seconds

Man has many ways of taking solids from liquids, such as freezing, evaporating, filtering and applying centrifugal action, but the transformation of a broth 99 per cent water to air-dry "newsprint" in 45 seconds is unique. Proper amounts of ground pulp and sulphite are slushed into a mixing box, together with alum and blue color. The "liquid paper" feeder is located at one end of a huge mass of machinery 250 feet long. Leaving the feeder tank in a cascade twelve and a half feet wide and half an inch deep, it falls on a belt of copper screening. As the screen moves swiftly along water falls through and is also pulled through by vacuum chambers.

Under one's eyes a stream of broth running three times as fast as a man can walk changes to a wet sheet of pulp. This sheet swings across a gap, leaving the wire to land on a wool blanket which, followed by cotton blankets, will carry it 200 feet to the other end of the room. On the way the blankets carry it between huge rolls that press out more water and wind it about 44 superheated drums as big around as hogsheads, which rob the paper of still more water. After running it nearly 500 feet, in and about, all in 45 seconds, the gargantuan machine delivers the twelve and a half foot sheet air dry to the calenders. This set of polished steel rolls puts on a finish.

Thrills of Industry's Drama

The starting of a paper machine holds all the thrills of those well-known dramas of industry, "The Arrival of the Limited," or "Pouring Steel." Like a railroad train, the paper machine starts on schedule. Ranging themselves alongside, the crew nervously rush final details. One hurriedly darns a "run" in the big copper screen belt. The man who watches the flow takes his place in a "crow's nest." Somewhere a powerful whistle lets go. The wire screen belt starts, gathers speed—faster, faster. A barefoot man wearing brief trousers and an amputated shirt turns a compressed air hose on the steam-heated rolls and blankets still waiting motionless, to drive out any dust. Now the pulp river is falling on the wire belt but it goes on around and drops into a pit below.

Near the "dropping off" end of the wire belt a mounted compressed air nozzle slits the twelve and a half foot sheet of wet pulp four inches from the edge. "WATCH THIS!" a guide shouts above the din. Now the felt blanket, rollers and drums start. Both blanket and screen belts are running at 1,000 feet per minute, with a six inch gap between. How to bridge the gap? An Horatio of the mills stands there gripping a compressed air gun instead of sword. The four inch strip is to be the thread. When it has made the jump the remaining twelve feet two inches will follow like sheep crossing a stream after a leader. Horatio turns the air gun on the strip, cuts it off and lifts it across to the spinning felt belt on a bed of air. If it piles up in the rolls other barefoot men with similar handy air hoses scoot it out of the way. When the thread is running free the cutting nozzle on the screen belt is moved across until the whole twelve and a half feet of wet pulp flies across the gap to its fate.

What Makes a Paper

To convert that block of spruce wood 2 inches by 3 inches by 4 inches into your newspaper, it has required enough electricity to light four 60-watt lamps one hour, nearly 3 pounds of steam, two-tenths of a pint of fuel oil, and 10 seconds of one man's labor. But it took, on an average, for all the production processes, only five one-hundredths of a second per 24-page paper, which is much quicker than a cat can wink its eye.

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The Dead Sea, Another Source of Potash

APPREHENSION aroused in the agricultural regions of the United States over the reported agreement by the French and German potash interests is not excited by a world shortage of this chemical which helps to give new life to worn-out land.

The Dead Sea may supply potash. So may Texas. But the Prussian and Alsace deposits, capable of satisfying world needs for two or three thousand years, are more readily reduced to a useful compound than most of the other world potassium resources.

Five Times as Salty as Ocean Water

The Dead Sea depression having no outlet, all the salts contained in the large original inland sea were retained when evaporation reduced the volume of the body of water to its present dimensions. In addition, for hundreds of thousands of years the Jordan and the other streams and torrents that flow from the desert hills into the basin have been carrying in additional salts until now the waters of the Dead Sea constitute one of the most highly concentrated natural brines in existence. It is estimated that on the average some six million tons of water flow into the Dead Sea daily, and since the level of the sea changes but little, an equal amount is pumped out daily by evaporation.

Whereas ocean water contains about one-twentieth of its weight in dissolved solids, the solids in solution in Dead Sea water make up one-fourth its weight. Potassium chloride makes up about one-fifteenth of the total solids but common salt (sodium chloride) is fully five times as plentiful. The isolation of the potassium salts, therefore, might be somewhat difficult on a commercial scale.

Ashes or Petroleum May Have Caused Destruction

The present Dead Sea is 47 miles long and about 10 miles wide. Its surface lies approximately 1,300 feet lower than sea level and at its deepest point its bottom lies another 1,300 feet down. This great rift in the earth's crust, therefore, lies 2,600 feet below sea level and is the deepest hole in the land anywhere in the world. Because of the intense heat and dryness and the presence everywhere of salt the land immediately about the Dead Sea is a region of desolation. On some of the flats a few straggling, thorny desert plants grow and in some sheltered wadies where the springs are fresh, small groups of palms struggle for existence. Most of the area, however, is a dry, rocky waste encrusted with salt, or nearer the sea, with slimy salt mud flats.

The Land of Sodom and Gomorrah

The Hebrew Scriptures have thrown an atmosphere of tragedy about this country. There, the chronicle states, were situated the wicked cities of Sodom and Gomorrah, destroyed by the wrath of Jehovah; and there the modern reader sees the blasted region, seared by unbearable heat, with its bitter death-dealing waters, prove the story.

According to the Biblical narrative the Jordan Valley, and the plain near its mouth on the shores of the Dead Sea where the destroyed cities lay, shared

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the exception. The low fogs bring all operations to a standstill. A peculiar feature of Alaska weather is the prevalence of high fogs, which may occur when all other surveying conditions are favorable. They hide from view the tops of the hills and mountains, needed in the triangulation and off-shore hydrography.

Field work along the coast during the winter is out of the question in all sections. From May to October is the extent of the season in southeastern Alaska. The season is shortened at both ends farther north and along the Aleutian chain of islands by early fall and late spring storms, and in the upper part of Bering Sea it is still further shortened by the persistence of the ice floes, which may not disappear until July.

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THE SUPPOSED POINT OF THE CROSSING OF THE JORDAN BY THE CHILDREN OF ISRAEL

Religion, history, and nature conspire to make the Jordan the most famous river of the earth. Across it the hosts of Israel were led into the Promised Land; in its waters the Christian rite of baptism had its birth; up and down its valley many civilizations in the morning of history rose and fell. Perhaps the strangest thing about this famous river is that none of the ancients ever guessed that its mouth was below the level of the sea. It was not until 1874 that accurate measurements were made and the mouth of the river was found 1,292 feet below the Mediterranean, less than sixty miles away (see Bulletin No. 4).

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How America Changed Turkestan

A PROPOSED American expedition into Central Asia turns attention to Turkestan. There are two Turkestans: Chinese or East Turkestan, and Russian or West Turkestan. The world knows much more about the latter, reached by Russian railways, than about isolated, mountain-rimmed Chinese Turkestan.

West Turkestan has changed much in recent years, and it is America which indirectly, has brought about the change.

In a communication to The Society, Maynard Owens Williams explains how these changes were wrought.

The "Queen of Rugs"

"The Tekkintzi rug, more commonly known by the less distinctive name of Bokhara, is the loveliest product of the desert loom," he writes. "Its charm lies not in intricacy of design, manifold detail, or symbolic meaning. It is not a picture in wool. Brilliancy of coloring it does not have. But in richness of tone the Tekkintzi wins its rightful place as queen of rugs.

"Then came the Russian migration, creeping down toward India, and the fearless nomad was cruelly beaten in his own field by the well-armed fighters of an agricultural race. The locomotive came to shriek derision at his train of stalking camels, and a band of shining steel cut its burning way across his trackless desert.

"Then the trade in rugs, which began as a matter of art and individual choice, became a commercial transaction. As the pastures became smaller, irrigated plots made it possible for the nomad to become a farmer, and the dweller of the yurta began to buy with the product of his wife's labor the frames for his felt hut, instead of making them himself from the reeds of the marshes. The old roaming life was gone and mud huts, plain and square, began to grow up from the desert plain, usually centering about a homely station building. Not flocks but rugs became the source of income.

A Wife's Rugs Were Her Dowry

"For centuries, possibly extending back to the Iranian peoples whom Alexander found here on his way to India, the Tekke maiden had been taught to dye and weave. When she was married to her Mohammedan husband, the young bride took with her to her master's hut the rugs her patient toil had formed, and he in turn paid a corresponding price to her parents. Her dowry was her skill and its product.

"Gradually these masterpieces in mahogany, deep chocolate, terra-cotta, old rose, burnt orange and black found their way to America, where their appeal was irresistible. Buyers raced one another across Europe into the Trans-Caspian home of history to secure the priceless treasures of a conquered race. The skill of the Tekke woman began to win its reward. Her genius has caused the art world to wear a path to her hut and her open-air loom. But there was the unhappy side.

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the early good fortune of the Promised Land itself and "flowed with milk and honey." But an end was put to this pleasant condition by the rain of brimstone and fire.

Early Sea Swallowed Galilee

The story of the region deciphered from its rocks by geologists begins much earlier than the days of the patriarchs whose actions are recorded in the Bible. This record seems to indicate that Palestine and the whole western end of Arabia rose from the sea a million or more years ago in what geologists term the Tertiary era. Shortly after the rise, it seems, a great slice of the land parallel to the coast of the Mediterranean sank to great depth, forming the huge rift valley, "the Ghor," now occupied by the Jordan River and the Dead Sea.

It is not clear whether there was a connecting channel between the Mediterranean and the great valley; but a well-defined ancient beach indicates that in those remote times the great depression held a sea or lake at about the same level as that of the Mediterranean. The Jordan did not then exist; its entire valley as well as the Sea of Galilee was swallowed up in the parent of the Dead Sea, which was some 200 miles long and 10 to 15 miles wide.

Ready-Made Valley

It is believed that the climate of Palestine in remote times was moist and that the great inland lake was for a while kept at its highest point. When drier conditions set in the lake began to shrink, eventually retreating into the present position of the Dead Sea and exposing the valley now occupied by the Jordan. This is practically the only large river in the world which flows in a valley ready-made for it almost from source to mouth.

It is quite possible that even six or seven thousand years ago, in the era to which the Biblical chronicles reach, the then relatively moist climate of Palestine made the plain near the mouth of the Jordan a rich land such as that which Lot found. It is also quite possible that the "Cities of the Plain"—Sodom, Gomorrah, and their fellows—perished in a cataclysm brought about by a modern secondary adjustment in this region of tremendous earlier geological disturbance.

Find Ancient Volcano Near Sodom Site

Because the intense heat and pressure are almost sure to prove fatal to others than the few hapless Arab nomads that manage to survive in the region, this area has not been intensely studied by scientists. It was at first thought that there is no evidence of recent volcanic action and that the traditional destruction of the cities by a rain of fire and brimstone may have referred to the explosion of pockets of crude petroleum. A scientist who visited the region in 1909, however, reported a small extinct volcano in the northeastern corner of the Dead Sea near the reputed site of Sodom and concluded that a shower of ashes from this vent may have caused the catastrophe so vividly described in Genesis.

Caught in Own Mesh

"Only the rich young Turkomans could afford to buy a wife at the exorbitant price her skill made possible. Parents raised the price of their daughters, consoling themselves with the fact that if they could not produce offspring they could at least produce valuable rugs. The age of marriage became higher. Caught in the trap which skillful women had woven, the young men revolted from the exaggerated demands of the avaricious and unromantic parents and sought cheaper wives elsewhere, while Tekke women, robbed of love and enmeshed in their own skeins of fine wool, dragged out busy lives alone.

"The Turkoman is a fine, erect man, whose real height is accentuated by a massive, shaggy sheepskin shako till he seemed a veritable giant. With American methods he could have won the hand of any wife he chose. But he was forced by custom to follow the method of barter and his purse was as thin as his lips.

Wives at One-tenth the Cost

"Among the Persians, Kirghizes, and Sarts this militant Romeo bought wives for a tenth what a Turkoman woman would cost. But he had to pay the price in the irregular features and smaller bodies of his offspring. Commerce robbed him of his proper mate and put in her place an inferior woman who bore homeliness instead of beauty."

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THREE SCOWS FULL OF SALMON FOR THE CANNERY AT CHIGNIK

Salmon are the only attraction that draw white men to the Aleutians. The foggy, cold climate makes this volcanic chain one of the most unlovely regions of the earth. Sparse settlements of Aleutian Indians are the chief habitations (see Bulletin No. 3).